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U.S. Department of the Interior • U.S. Geological Survey

# MINERAL INDUSTRY SURVEYS

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Gordon P. Eaton, Director

Reston, VA 20192

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For information, contact:

Joseph Gambogi, Commodity Specialist

Telephone: (703) 648-7718, Fax: (703) 648-7722

E-mail: [jgambogi@usgs.gov](mailto:jgambogi@usgs.gov)

Robin Kaiser (Data), (703) 648-7948

Internet: <http://minerals.er.usgs.gov/minerals>

MINES FaxBack: (703) 648-4999

MINES-DATA: (703) 648-7799

## TITANIUM IN THE FOURTH QUARTER 1996

### Ores and Concentrates

In Australia, Consolidated Rutile Ltd. has relocated the dredger and floating concentrator from its exhausted Bayside deposit to its Ibis-Alpha heavy mineral deposit on North Stradbroke Island. During the transition, the plant was upgraded to process up to 3,000 metric tons of sand per hour. According to the company, the operation has an expected life span of 9 years.<sup>1</sup>

In South Africa, an explosion halted production at Namakwa Sands Ltd.'s titanium slag facility at Brand-se-Baai. The explosion was caused by water coolant leaking into roof of the plasma arc furnace. Production was expected to resume in the first quarter of 1997 following repairs to the furnace lining. Production of rutile and zircon concentrates from Namakwa's nearby minerals separation plant was not affected.<sup>2</sup>

In Vietnam, Bimal Minerals Co. completed construction and commenced production of heavy minerals concentrate at its wet separation plant at Cat Khahn in the Binh Dinh Province. Bimal is a joint venture between Binh Dinh Minerals Co., Malaysia Mining Co., and Pendorong Co. Bimal plans to truck the concentrate from the wet separation plant to its existing dry separation plant in Degi. Initial production is expected to be 4,000 tons per month of ilmenite (50 to 51% TiO<sub>2</sub>).<sup>3</sup>

In Kenya, Tiomin Resources Inc. has acquired an 80% interest in the licensed mineral rights of four prospecting areas along the Kenyan coast. According to the company, exploratory drilling in the Mambrui area has delineated a resource of 650 million tons of titanium and zirconium bearing sands. A pre-feasibility study of the Mambrui area is currently underway and is expected to be completed in 1997.<sup>4</sup>

### Metal

According to the U.S. Geological Survey, receipts of titanium

scrap totaled 10,400 tons with 4,110 tons of home scrap and 6,320 tons of purchased scrap. Scrap receipts decreased 10% compared with those of the previous quarter. Ingot shipments were 5,330 tons.

The U.S. Department of Commerce, International Trade Administration (ITA) published final results of an antidumping review for imports of titanium sponge from Russia. The review covered imports from Berezniki Titanium-Magnesium Works (AVISMA), Interlink Metals and Chemicals, Inc., and Cometals Inc. during the period August 1, 1994, through July 31, 1995. Under the review, the ITA concluded that AVISMA, a producer of titanium sponge would continue to be subject to the Russia-wide 83.96% antidumping margin. However, the ITA determined the margin for the two trading companies, Interlink and Cometals, would be revised to 0% and 28.31%, respectively.<sup>5</sup>

In accordance with the National Defense Authorization Act for Fiscal Year 1996, Public Law 104-106, Section 3305, 227 tons (250 short tons) of titanium sponge from Defense National Stockpile were transferred to the U.S. Army during 1996. The material is designated for use in the weight reduction program of the main battle tank upgrade program.

Carpenter Technology Corp. announced plans to purchase Dynamet Inc. Carpenter currently produces stainless steels, high-temperature alloys and engineered products while Dynamet produces titanium bar and wire for the aircraft specialty fastener industry. Dynamet employs about 320 people with plants in Clearwater, FL, McMurray, and Bridgeville, PA. The acquisition was expected to be completed by March 1997.<sup>6</sup>

### Notice

Excluding prices, the data in this publication have been rounded to three significant figures.

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<sup>1</sup>Industrial Minerals. New Heavy Mineral Deposit for CRL. Dec. 1996, p. 67.

<sup>2</sup>\_\_\_\_\_. Namakwa's TiO<sub>2</sub> Slag Production Interrupted. Jan. 1997, p. 12.

<sup>3</sup>\_\_\_\_\_. Bimal Inauguration & First Ilmenite Shipment. Dec. 1996, p. 23.

<sup>4</sup>\_\_\_\_\_. Tiomin Buys Titanium Minerals Stake. Nov. 1996, p. 13.

<sup>5</sup>Federal Register. Titanium Sponge From the Russian Federation; Notice of Final Results of Antidumping Duty Administrative Review. Nov. 15, 1996, pp. 58525-58531.

<sup>6</sup>Carpenter Technology Corp. Press Release. Carpenter Announces Major Acquisition, Short Term Business Outlook. Jan. 7, 1997.

TABLE 1  
COMPONENTS OF U.S. TITANIUM METAL SUPPLY AND DEMAND 1/

(Metric tons)

	1995		1996				
	Fourth quarter	Year to date	First quarter	Second quarter	Third quarter	Fourth quarter	Year to date
Production:							
Sponge	W	W	W	W	W	W	W
Ingot	10,600	39,800	12,300	13,000	13,000	13,100	51,400
Mill products	6,200	23,300	7,150	7,690 r/	8,000 r/	7,860	30,700
Exports:							
Sponge	45	225	87	62	136	4	289
Scrap	599	3,420	540	600	1,080	347	2,570
Ingot, slab, sheet bar, etc.	495	1,960	640	1,080	918	480	3,120
Other unwrought	240	603	118	111	110	63	402
Bars, rods, profiles, and wire	445	2,030	522	332	294	88	1,240
Other wrought	790	2,560	737	1,010	716	205	2,660
Total	2,610	10,800	2,640	3,190	3,250	1,190	10,300
Imports:							
Sponge	1,150	7,560	2,480	2,010	2,460	2,280	9,230
Waste and scrap	3,720	11,100	4,210	4,130	4,180	2,720	15,200
Ingot, billet	574	1,880	444	309	752	702	2,210
Other unwrought	229	1,180	108	132	204	99	543
Articles of titanium	35	272	58	108	57	34	257
Other wrought (mill products)	690	1,600	1,320	1,000	1,800	1,330	5,450
Total	6,400	23,600	8,630	7,690	9,450	7,160	32,900
Stocks, end of period:							
Sponge, Government 3/	33,400	XX	33,400	33,400	33,400	33,200	XX
Sponge, Industry	5,270	XX	5,290	5,500	4,000	4,390	XX
Scrap	9,430	XX	11,800	10,100	15,400	15,900	XX
Ingot	3,560	XX	4,120	3,940	3,970	4,710	XX
Total industry	18,300	XX	21,200	19,600	23,300	25,000	XX
Consumption:							
Sponge	5,600	21,500	6,680	6,310	8,570	6,850	28,400
Scrap	5,850	20,600	6,110	6,130	6,740	7,320	26,300
Ingot	7,930	30,600	8,960	9,970 r/	9,420	9,920	38,300
Mill products (net shipments):	5,340	19,800	6,010	6,110	6,960 r/	6,840	25,900
Forging and extrusion billet	2,390	8,820	2,340	2,330	3,380 r/	3,200	11,200
Rod and bar	917	2,770	655	981	670	793	3,100
Other 4/	2,040	8,180	3,010	2,800	2,910	2,850	11,600
Castings (shipments)	76	480	227	169	139	144	680

r/ Revised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Imports and exports for fourth quarter 1996 include October and November only. December 1996 data not available at time of publication. Production and consumption data are for full quarter.

3/ Includes 23,300 tons stockpile grade and 9,860 tons nonstockpile grade material.

4/ Data for sheet and strip, plate, fastener stock and wire, extrusions (other than tubing), pipe and tubing, and other have been combined to avoid disclosing company proprietary data.

TABLE 2  
COMPONENTS OF U.S. TITANIUM DIOXIDE PIGMENT SUPPLY AND DEMAND 1/

(Metric tons)

	1995		1996				
	Fourth quarter	Year to date	First quarter	Second quarter	Third quarter	Fourth quarter	Year to date
Production	291,000	1,250,000	296,000	307,000	304,000	320,000	1,230,000
Imports 2/	39,600	183,000	41,900	41,000	42,000	NA	NA
Exports 3/	64,900	342,000	76,500	75,300	83,000	NA	NA
Stocks, end of period	120,000	XX	129,000	116,000	98,300	107,000	XX
Apparent consumption 4/	257,000	1,080,000	252,000	285,000	281,000	NA	NA

NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Based on Harmonized Tariff Schedule of the United States (2823.00.0000, 3206.10.0050, and 3206.10.0010).

3/ Based on Harmonized Tariff Schedule of the United States (2823.00.0000 and 3206.10.0000).

4/ Apparent consumption = production + imports - exports - stock increase or + stock decrease.

Source: Bureau of the Census.

TABLE 3  
U.S. EXPORTS OF TITANIUM PRODUCTS 1/

(Metric tons)

	1995		1996				
	Fourth quarter	Year to date	First quarter	Second quarter	Third quarter	October-November	Year to date
Metal:							
Unwrought:							
Sponge	45	225	87	62	136	4	289
Scrap	599	3,420	540	600	1,080	347	2,570
Billet	79	343	130	88	85	67	370
Blooms and sheet bars	251	1,130	401	943	802	373	2,520
Ingot	165	483	109	50	31	40	230
Other unwrought	240	603	118	111	110	63	402
Wrought:							
Bars, rods, profiles, and wire	445	2,030	522	332	294	88	1,240
Other	790	2,560	737	1,010	716	205	2,660
Ores and concentrates	4,690	32,300	3,090	5,630	6,050	324	15,100
Oxides	9,210	36,000	8,320	7,730	11,300	5,370	32,800
Pigments	55,700	306,000	68,200	67,600	71,600	31,200	239,000

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM METAL 1/

(Metric tons)

	1995		1996				
	Fourth quarter	Year to date	First quarter	Second quarter	Third quarter	October-November	Year to date
Unwrought:							
Sponge:							
China	135	478	79	176	274	158	687
Japan	466	1,140	849	891	1,200	925	3,860
Kazakstan	--	60	60	45	330	470	905
Russia	519	5,490	1,450	644	583	721	3,400
Other	34	392 r/	48 r/	256 r/	71	4	378
Total	1,150	7,560	2,480	2,010	2,460	2,280	9,230
Waste and scrap:							
Canada	103	368	91	101	106	85	383
France	56	364	228	251	181	119	779
Germany	109	613	140	182	204	23	548
Japan	682	1,830	487	692	717	508	2,410
Italy	288	794	406	233	330	275	1,240
Russia	1,630	3,800	1,950	1,390	1,160	749	5,250
United Kingdom	617	2,350	656	861	1,140	748	3,400
Other	235	988	251	419	345	211	1,230
Total	3,720	11,100	4,210	4,130	4,180	2,720	15,200
Ingot and billet:							
France	56	275	26	5	--	--	30
Kazakstan	--	--	91	--	--	--	91
Japan	24	32	43	3	19	2	66
Russia	342	918	183	240	402	435	1,260
United Kingdom	118	622	86	62	218	190	555
Other	34	34	15	--	113	75	203
Total	574	1,880	444	309	752	702	2,210
Powder	93	238	39	36	88	53	216
Other 2/	136	941	69	96	116	46	327
Wrought:							
Articles of titanium:							
Castings	1	4	1	1	1	1	4
Other	33	267	57	107	56	33	253
Other wrought (mill products):							
Bars, rods, profiles, and wire	153	540	416	187	427	506	1,540
Plates, sheets, strips, and foil	445	737	775	746	1,050	716	3,290
Tubes and pipes	37	96	119	59	82	9	269
Other	55	222	10	9	241	94	354
Total mill products	690	1,600	1,320	1,000	1,800	1,330	5,450

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes blooms, sheet bars, slabs, and other.

Source: Bureau of the Census.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM CONCENTRATES 1/

(Metric tons)

	1995		1996				
	Fourth quarter	Year to date	First quarter	Second quarter	Third quarter	Fourth quarter	Year to date
Ilmenite:							
Australia	74,400	294,000	89,100	58,000	68,900	101,000	317,000
India	--	62,100	80,100	34,200	--	--	114,000
Sierra Leone	--	5,950	--	--	--	--	--
Sri Lanka	--	--	--	--	29,400	--	29,400
Ukraine	--	41,200	15,800	--	--	--	15,800
Other	--	69,300 r/	--	--	--	--	--
Total	74,400	473,000	185,000	92,200	98,400	101,000	477,000
Titanium slag:							
Canada	10,200	41,200	6,750	4,790	--	--	11,500
South Africa	103,000	347,000	41,600	108,000	115,000	94,100	358,000
Other	--	--	--	2	--	--	2 2/
Total	113,000	388,000	48,300	113,000	115,000	94,100	370,000
Rutile:							
Australia	18,700	61,700	17,800	8,080	5,410	14,700	46,000
Sierra Leone	--	10,600	--	--	--	--	--
South Africa	39,200	114,000	32,600	37,700	41,100	13,400	125,000
Other	5,450	5,460	--	843	337	--	1,180 2/
Total	63,300	192,000	50,400	46,600	46,800	28,100	172,000
Synthetic rutile:							
Australia	16,300	122,000	35,100	19,100	41,000	13,300	108,000
Malaysia	1,520	4,940	1,900	1,140	3,810	--	6,850
Other	1	43	--	--	27,200	--	27,200 2/
Total	17,800	127,000	37,000	20,200	71,900	13,300	142,000
Titaniferous iron ore:							
Canada	1,690	88,400	308	36,200	15,000	38,700	90,200

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Analysis of data under review.

Source: Bureau of the Census.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM PIGMENTS 1/

(Metric tons)

	1995		1996				
	Fourth quarter	Year to date	First quarter	Second quarter	Third quarter	October-November	Year to date
80% or more titanium dioxide:							
Canada	17,100	61,600	13,400	16,300	17,600	12,300	59,600
China	684	3,620	204	316	120	54	693
Finland	424	2,430	374	214	223	121	931
France	1,460	5,560	749	718	711	388	2,570
Germany	4,480	21,300	3,470	3,470	4,490	2,480	13,900
Japan	1,530	6,000	1,260	1,170	916	616	3,960
Norway	780	4,400	1,710	1,390	1,390	578	5,060
Poland	955	4,300	820	--	20	40	880
Singapore	1,090	4,450	1,150	1,090	1,170	631	4,030
Slovenia	340	1,840	571	198	375	265	1,410
United Kingdom	5	1,680	61	121	1	1	184
Other	733	3,600	929	696	911	897	3,430
Total	29,600	121,000	24,700	25,700	27,900	18,400	96,600
Other titanium dioxide:							
Canada	1,060	16,700	392	186	210	197	985
France	1,710	8,120	3,130	1,440	2,250	2,480	9,300
Germany	281	1,260	482	276	342	131	1,230
South Africa	881	6,280	1,230	1,910	1,390	922	5,450
Spain	275	1,250	2,090	2,910	4,220	3,260	12,500
United Kingdom	213	3,300	819	1,420	631	492	3,360
Other	956	3,180	1,650	971	585	709	3,910
Total	5,370	40,400	9,790	9,110	9,640	8,190	36,700
Titanium oxide:							
Belgium	594	2,610	660	607	637	207	2,110
Canada	1,320	8,560	2,580	245	--	88	2,910
France	1,670	6,740	1,530	1,870	888	918	5,210
Germany	387	654	1,470	2,300	1,890	1,920	7,580
Japan	291	1,210	554	281	142	120	1,100
United Kingdom	--	641	60	61	80	120	321
Other	346	2,070	525	814	789	777	2,910
Total	4,600	21,800	7,380	6,180	4,430	4,150	22,100
Grand total	39,600	183,000	41,800	41,000	42,000	30,700	155,000

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 7  
PUBLISHED PRICES OF TITANIUM MATERIALS

(End of period, Fourth quarter 1996)

Specification of material	Range
Ilmenite, per metric ton:	
F.o.b. Australian ports	\$82 -- \$92
Titanium slag, per metric ton: 1/	
80% TiO <sub>2</sub> , Canada	292
85% TiO <sub>2</sub> , South Africa	353
Rutile, per metric ton:	
Natural:	
Bagged, f.o.b. Australian ports	700 -- 800
Bulk, f.o.b. Australian ports	525 -- 600
Sponge metal, per pound:	
Estimated, domestic	4.25 -- 4.50
Titanium scrap, per pound:	
Turnings, unprocessed (Ti-6Al-4V)	.85 -- .90
Ferrotitanium, per pound:	
70% (max. 4.5% Al) per pound Ti	1.68 -- 1.75
Titanium dioxide pigment, per pound:	
Anatase, f.o.b. U.S. plants, list price	1.06 -- 1.08
Rutile, f.o.b. U.S. plants, list price	1.08 -- 1.10

1/ Estimated based on U.S. imports for consumption.

Sources: American Metal Market, Chemical Marketing Reporter, Industrial Minerals (London), Platt's Metals Week, and industry contacts.